

Attorney Docket No. 06618-512001  
Serial No. 09/838,344  
Response dated January 27, 2004  
Reply to Office Action dated October 27, 2003

REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested.

A new title has been provided. Should the Examiner, however, have any suggestions for a title which is believed more descriptive, these suggestions would be appreciated.

Claims 1-2, 4, 6, 9, 11 and 19 stand rejected under 35 USC 102(e) as allegedly being anticipated by Koyama. Claims 3, 5, 7, 8, 10, 12-18, 20 and 21 stand rejected under 35 USC 103 as being obvious over Koyama. Each of these contentions, however, is respectfully traversed, and it is respectfully suggested that the rejection does not meet the Patent Office's burden of providing a *prima facie* showing of unpatentability.

Initially, a consideration of the Koyama reference shows that it is a very different kind of system than that currently disclosed and claimed. Admittedly, a clear substrate is used which has two gratings thereon; both of which are refractive gratings. These refractive gratings are used to provide the light to a windshield in order to detect raindrops and water incident thereon. As stated in Koyama, the refracted light is produced "on the basis of a certain constant rule ... at a constant angle with respect to the incident light". See,

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Attorney Docket No. 06618-512001  
Serial No. 09/838,344  
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generally, column 3, lines 56-62. This enables the light to be introduced into the plate at an arbitrary angle, but sets the angle which is sent to the windshield element (see, generally, column 4, lines 14-19). By setting the incident angle to the windshield, a total internal reflection situation can be set up in the windshield; see, generally, column 4, line 24-36.

Normally, total internal reflection occurs; see column 4, lines 37-43 and lines 49-51. However, when water is present, total internal reflection will not occur, and the light will not be reflected; see column 4, lines 52-54. The incident angle is adjusted by the grating in order to create the proper angles to enable this phenomena (see column 4, lines 55-59).

Having discussed Koyama in some detail, it should be apparent that Koyama does not suggest or teach the limitations of claim 1. Specifically, claim 1 requires a laser and a single substrate that includes a first diffractive optical element which receives the beam and "produces a fringe based thereon". The refractive element in Koyama does not produce a fringe, but, as discussed above, sets the incident angle of the incoming light to the glass.

Claim 1 also requires a scattering element which scatters the fringe beam based on particles being detected. No such "scattering element" is present in Koyama; rather, in Koyama,

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Attorney Docket No. 06610-512001  
Serial No. 09/838,344  
Response dated January 27, 2004  
Reply to Office Action dated October 27, 2003

the total internal reflection coefficient is changed, rather than a scattering element being used.

For these reasons, claim 1 includes multiple elements which are not taught or suggested by Koyama, and therefore, Koyama does not anticipate claim 1. The claims which depend from claim 1 should be allowable for similar reasons to those discussed above with respect to claim 1, as well as on their own merits. Many of the dependent claims were rejected as obvious, with the rejection stating that certain elements such as the diverging fringes etc. "are old and known in the art". Initially, it should be noted that Koyama teaches nothing about diverging fringes, and, in fact, it is entirely unclear how Koyama could be used with anything like diverging fringes. Certainly, there is no teaching in Koyama of using his device or techniques in that way. Therefore, modification of Koyama to include diverging fringes would require undue experimentation. In any case, since Koyama works based on a certain principle, changing Koyama to use a different principle, specifically the principle of diverging fringes, would appear only to be possible based on hindsight.

Claim 3 requires a pattern being formed on the second surface, that pattern receiving particles crossing the pattern and collecting the light that crosses those particles as

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Attorney Docket No. 06618-512001  
Serial No. 09/838,344  
Response dated January 27, 2004  
Reply to Office Action dated October 27, 2003

scattered light. Nowhere is there any teaching or suggestion of any such pattern in Koyama. Therefore, claim 3 should be further allowable.

One of the advantages of the single substrate approach of claim 1 is that the different optical components are inherently aligned with one another. Claim 5 defines that the housing holds the laser element and all the other elements in registration with one another, thus emphasizing its patentable distinctions.

Claim 7 specifies the size of the quartz substrate, thus further distinguishing over Koyama. Claim 8 specifies the fringes which again are totally foreign to anything taught or suggested by Koyama.

Claim 9 has been amended to emphasize that interference fringes are formed, thus distinguishing over the prior art for reasons discussed above.

The dependent claims of claim 1 should be allowable for reasons stated above.

In addition, claims 12 and 13 specify alignment marks which are in no way taught or suggested by anything in the cited prior art.

Claim 14 has been amended to include the limitations of claim 17 therein, reciting the fringe pattern in an area of the

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Attorney Docket No. 06618-512001  
Serial No. 09/838,344  
Response dated January 27, 2004  
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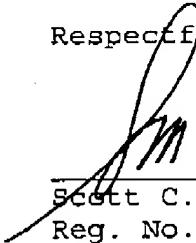
second side of the substrate. As described above, none of the cited prior art teaches or suggests such a fringe pattern being formed in this way.

Claim 19 further specifies the fringe pattern, and as described above, there is no teaching or suggestion of such a fringe pattern in the cited prior art.

In view of the above amendments and remarks, therefore, all the claims should be in condition for allowance. A formal notice to that effect is respectfully solicited..

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Respectfully submitted,

  
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